

NEW YORK NEUROLOGICAL SOCIETY.

April 8, 1902.

The President, Dr. Joseph Collins, in the chair.

*A Case of Asthenic Bulbar Paralysis.*—Dr. George W. Jacoby presented a young woman with asthenic bulbar paralysis. He said that this was only the second case that he had seen. The other case was that of a young man who now had an intermission in the disease that had lasted for three years. From the histories of other reported cases it was not probable that the man had permanently recovered. The patient presented was a girl of twenty years, who had been perfectly well until last May, when, while reading aloud, her voice was noticed to falter. Within a few weeks this became quite noticeable even on speaking. About this time there was some double vision. Later on there were nasal speech and regurgitation of fluids through the nose. Only within the last two months had she developed a slight weakness of the right hand. Dr. Jacoby called attention to the broadness of the mouth, the thickness of the lips, the almost expressionless appearance of the face, and the difficulty of pouting the lips as in the act of whistling. There is inability to completely close the eyes, and the reflexes are exhaustible.

*An Experimental Study of the Reflexes in Total Transverse Lesions of the Spinal Cord.*—Dr. William Aldren Turner, of London, presented a paper on this subject (see page 321).

Dr. Philip C. Knapp, of Boston, said that comparatively few of the writers upon the reflexes had dwelt upon one point, *i.e.*, the extreme difficulty of proving anatomically the fact that the cord is totally destroyed. In one of his own cases there was clinical proof of conduction through the cord, and sections were made with very great care in order to determine the condition of the softened portion of the cord. It was found extremely difficult to make out the presence of normal nerve fibers in the softened part although undoubtedly there must have been some. This might explain some of the published cases which appeared to contradict the rule. A case had come under his observation in which on removing the fractured laminæ the cord was found absolutely divided and the ends free. In this case a year after the accident there was flaccid paraplegia with loss of the knee-jerk and retained plantar reflex. This occurred before attention had been called to the Babinski reflex. Bastian's theory of the influence of the cerebellum upon the reflex seemed to be weakened by the fact that so rarely was there any change in the reflex in cases of cerebellar disease. The explanation of loss of the knee-jerk from complete section of the cord seemed to him far from satisfactory. It was known that if the entrance of the sensory fibers in the posterior horns and columns in the third and fourth lumbar segments were destroyed, and the corresponding cells and anterior roots innervating the quadriceps were destroyed, the reflex was lost, but even assuming that the nerve impulse must pass into the cord to the level of the cervical enlargement, or possibly higher, it was difficult to understand this by the experiments brought forward by Dr. Turner. If there were a reflex arc or a mechanism for the neuromuscular tonus, why should it be destroyed by a lesion high up while a lesion below, which

must cut off all communication, allows of the preservation of the reflex?

Dr. Charles K. Mills, of Philadelphia, said that he did not feel that he could contribute anything new to this interesting subject, but he would mention the fact that he had seen quite a number of cases, with autopsies, which tended to confirm the views expressed by Dr. Turner. He had had a number of autopsies on cases of incomplete section of the spinal cord in various regions, in which the conditions were those already described by Dr. Turner. He could recall several traumatic cases in which high lesions with complete loss of the knee-jerk had been present. His mind was far from being clear as yet with regard to the mechanism allowing of the retention of the knee-jerk under certain conditions and its loss under others. The cerebro-cerebellar theory had always seemed to him the most nearly satisfactory. He had had a comparatively large number of cases of cerebellar lesion, and these had shown interference with the knee-jerk, but the conditions had not been uniform. He had seen loss of the knee-jerk in cases afterwards demonstrated to be examples of cerebellar disease. He had seen increased knee-jerk and even crossed knee-jerk in connection with cerebellar disease, and he was satisfied that disease of the cerebellum plays a part in interfering with the knee-jerk as with other reflex phenomena. The fact that lesions at the cervico-dorsal junction when complete were apt to cause loss of the knee-jerk, was of great interest. The existence of a cilio-spinal center in a particular region of the cord might be suggestive with regard to the effect upon the knee-jerk and the lower reflexes in these particular cases.

Dr. Joseph Fraenkel thought, with Dr. Mills, that the more this problem was studied the less seemed to be really known about it which would be of value at the bedside. The presence of a cilio-spinal center high up in the cord might help us in the explanation of these phenomena. A number of heterogeneous phenomena were considered in connection with the reflexes. The plantar reflex, which seemed to be the only permanent skin reflex, was representative of the skin reflexes just as much as the knee-jerk was characteristic of tendon-reflexes. This knee-phenomenon was one of the expressions of the muscular qualities. A muscle possesses what is called irritability, and quite a complicated neural apparatus keeps up what is called muscular tonus. Whatever interfered with this influenced the tendon reflexes. In conjunction with the President of this Society he had carried on for four years a clinical study of the reflexes, measuring at the same time the tonicity of the muscles. This study embraced about 600 cases, and included certain interesting pathological findings. They had become convinced that the knee-jerk was absolutely dependent upon the muscle tonus. If the muscle tonus were increased through pain in the joint there would be an increase of the knee-jerk. When the lesion of the spinal cord had been slowly progressive there would be nutritive shortening of the muscle, but the muscle tonus not being destroyed the reflex would still persist. The tendon reflexes should really be placed in the same category with the visceral reflexes. The considerable discrepancy between the findings at the bedside and in the laboratory had been explained by a recent publication of Strümpell, in which it was stated that the mechanism of the reflexes in the lower animals and in man was different.

Dr. M. G. Schlapp referred to a reported case in which, on histological examination, the cord was found to be absolutely severed in the dorsal region. This case overthrew the Bastian theory. He thought the reflexes should be considered in their abnormal conditions. If a poison were introduced into the body it would exert a selective action on the neurones of the central nervous system. In cases of ergotism, lead poisoning, typhoid fever and brain tumor, degenerations were found in the

posterior columns and in the roots entering these columns. If these fibers were traced, they would not be found to pass into Goll's columns, and consequently they were short fibers. In many cases of brain tumor in which the tendon reflexes were missing there would be no sensory disturbance. These fibers were probably the sensory half of the reflex circuit. The loss of reflexes, he thought, could be explained by degeneration of the short neurones in the posterior roots having to do with the tendon reflexes. He had found this lesion of the cord in cases of transverse lesion of the spinal cord, and also in cases of brain tumor, and in a case of alcoholism. These were facts, and consequently demanded more careful attention than mere theories.

Dr. Joseph Collins said that his own views had been quite well expressed by Dr. Mills and Dr. Fraenkel.

Dr. Turner, in closing, said that until he had collected the results of his experiments in tabular form he had had no idea that the condition of the reflexes was so extremely variable. On referring to the literature he had found that this had been noted by several observers quite a number of years ago. He was in perfect accord with the position taken by Drs. Collins and Fraenkel. The condition of the knee-jerks was entirely due to the state of neuromuscular tonus, for it was just this which was affected by transection. The superficial anal reflex was a pure reflex, and was found usually in monkeys and commonly in man. Unfortunately, the plantar reflex could not be elicited in monkeys. The effects on the reflexes observed in cases of disease of the cerebellum and in experimental lesion of the cerebellum were very different. He thought we should ascribe these variable phenomena not so much to the existence of a tumor in the cerebellum as to interference with intracranial pressure from the presence of a morbid growth under the tentorium cerebelli.